

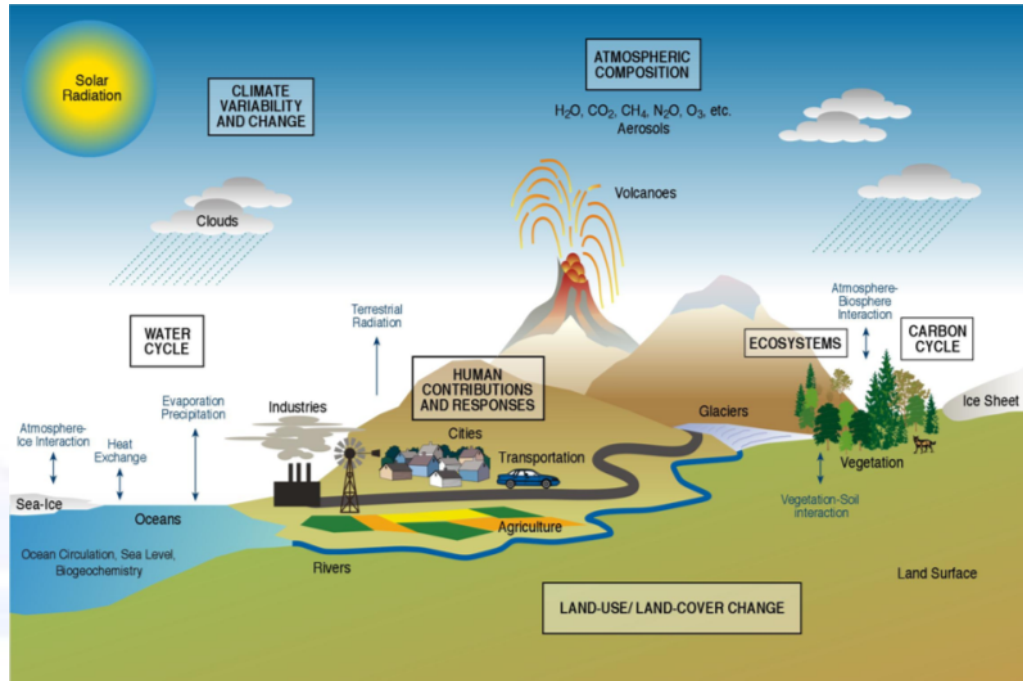


**Lawrence Friedl,
Amber Soja, Vince Ambrosia
NASA Earth Science**

Introduction

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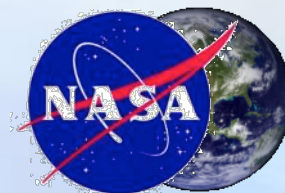
**Wildland Fires Team Meeting
Feb. 28 – March 2, 2017**



Supports basic and applied research on the Earth system and its processes to advance knowledge and benefit society.

In parallel with research, NASA pursues innovative and practical uses of Earth science data and results to inform decisions and actions.

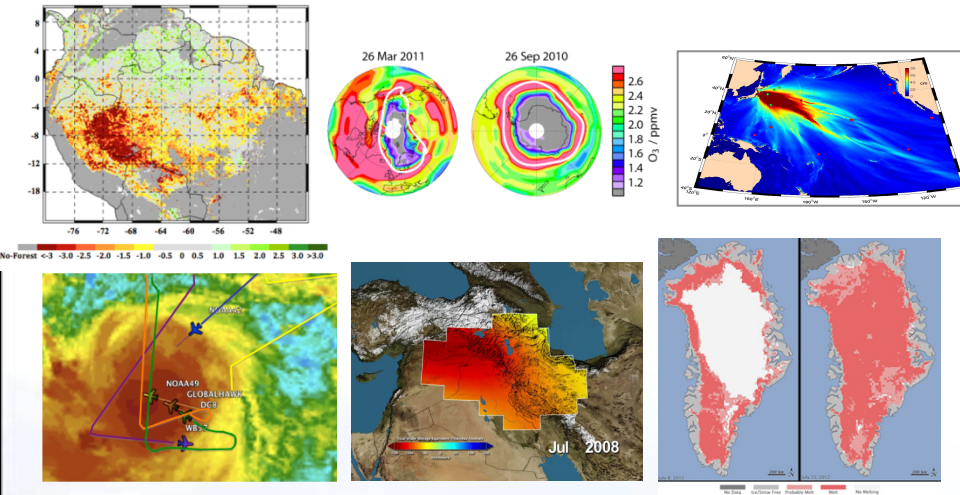
Technology
Flight Missions
Research
Data Systems
Education
Applications



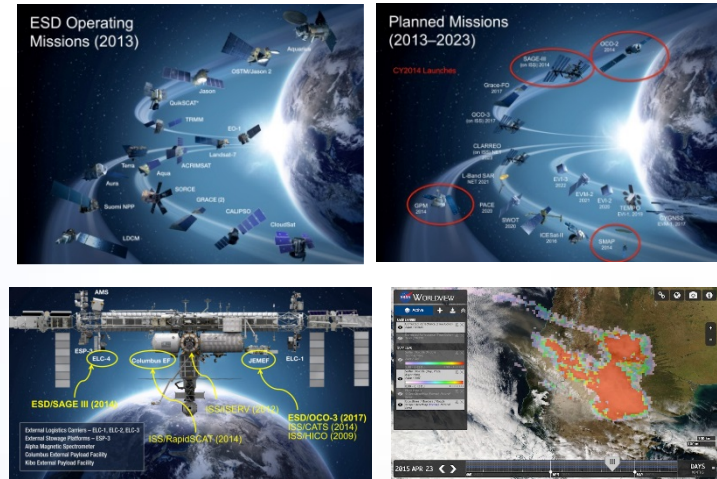
NASA Earth Science: Four Programs



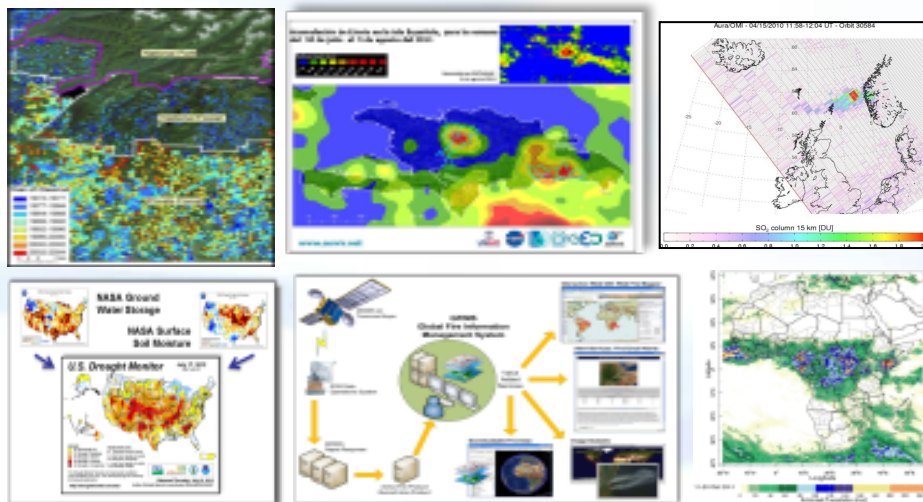
Research



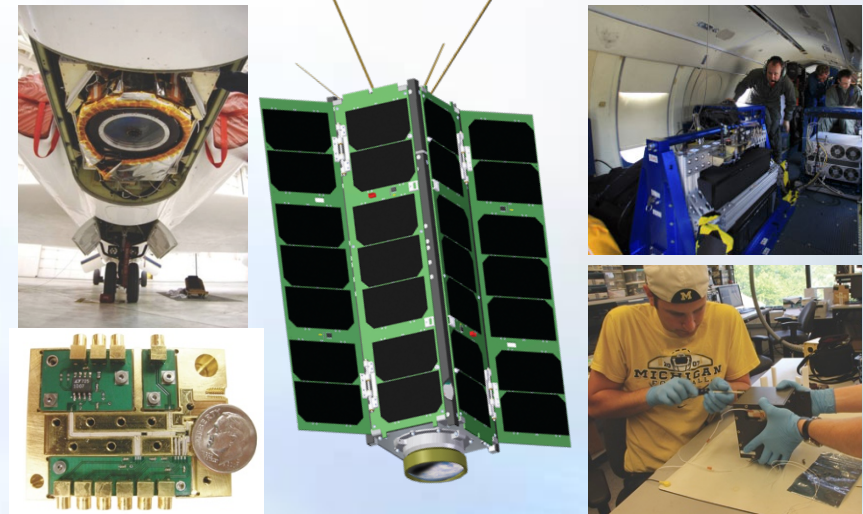
Flight (incl. Data Systems)



Applied Sciences



Technology





Applied Sciences serves a fundamental role to advance global knowledge about effective ways to extend and apply Earth science and inform decisions and actions

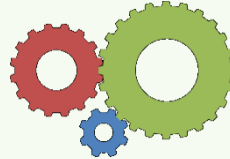
Applied Sciences Program: Lines of Business

Discover and demonstrate innovative and practical uses of Earth observations to inform decisions and actions.



Applications in Mission Planning

Identify applications early and throughout mission lifecycle, integrate end-user needs in design and development, enable user feedback, and broaden advocacy.



Societal & Economic Applications

Generate, test, develop, enable adoption, and extol applications ideas for sustained uses of Earth obs. in decisions and actions.



Capacity Development

Build skills, workforce, and capabilities in US and developing countries to apply Earth obs. to benefit society and build economies.

Key Principle: On-going experimentation to figure out how to better inspire applications, ideas, ways to broker, etc.

Emphasis in 5 Applications Areas



**Health &
Air Quality**



**Water
Resources**



**Ecological
Forecasting**



Disasters



**Wildland Fires
(through 2017)**

Support opportunities in additional areas



Agriculture / Food Security



Energy



**Transportation &
Infrastructure**

Climate & weather play into all areas

Capacity Building Program Element



The Capacity Building program improves the capabilities of individuals and institutions in the US and abroad, especially in developing countries, related to accessing and applying Earth observations. This context includes human, scientific, technological, organizational, institutional, and resource-based capacities.



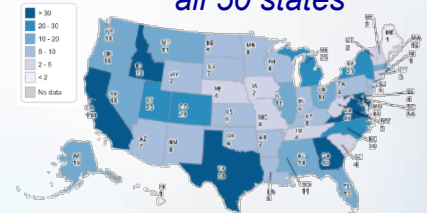
DEVELOP is a national training and development program for individuals to gain experience applying Earth observations through 10-week interdisciplinary projects, including with state and local governments.

2015:
393 Participants,
93 Projects,
156 Partners



ARSET, Applied Remote Sensing Training, builds skills in accessing and using Earth observations data across applications topics through computer-based training for government and private sector individuals.

2015: 2,877 trainees;
all 50 states



SERVIR is a NASA/USAID-sponsored initiative that enables uses satellite observations to help developing nations monitor, forecast, and respond to environmental changes.





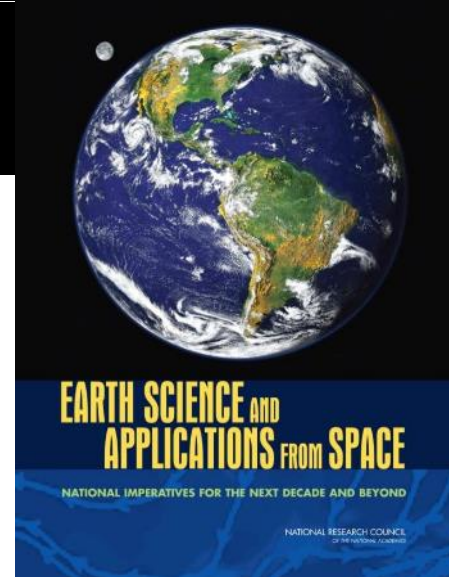
Earth Science & Applications from Space

The national strategy outlined here has as its overarching objective a program of scientific discovery and development of applications that will enhance economic competitiveness, protect life and property, and assist in the stewardship of the planet for this and future generations.

2007 Earth Science Decadal Survey ESD & Applied Sciences

Significant efforts for applications-oriented users to engage throughout the satellite mission lifecycle, especially planning, formulation, and development phases. Examples include:

- » Community Workshops
- » Early Adopters Programs
- » Mission Applications Plans
- » Applications Traceability Matrices
- » Webinars and Tutorials



NASA defines science to include research, applied research, and applications.

The relative emphasis on each is unique to an individual investigation.

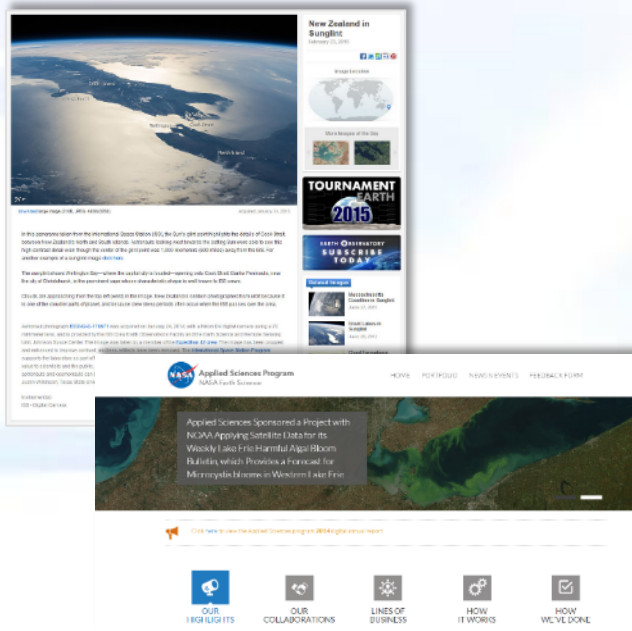
Communications



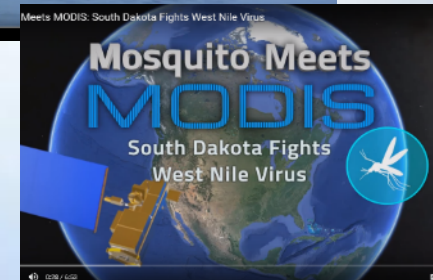
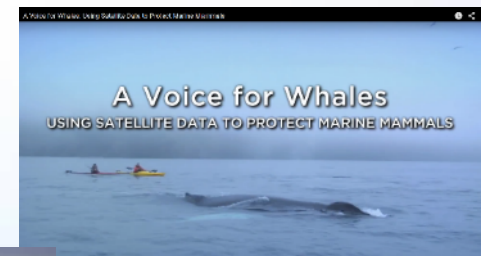
A significant emphasis on communications and outreach activities, especially to convey results to broad audiences.



Website, Earth Observatory



Videos



Applied Sciences Program: Four Highlights for 2017

NASA
Earth Science



Food Security

ROSES-2016 solicitation for Earth science applications to support food security and agricultural practices in the global food system.

Disasters

New ROSES call for apps focused on a few disaster types – flood, hurricane, earthquake. Projects to start at ARL 4 or 5. Partner contributions will be key.

Western Water Applications Office

Effort to engage Western states to apply Earth science data and models to inform water management decisions.

A regional and thematic approach to support water managers at local, state, and regional levels; companies; non-profits.

Managed by JPL, GSFC, and ARC. Community involvement planned.

Impact Analyses

Advance techniques to quantify the economic and social value from the use of Earth obs. to inform decisions.

Events to build familiarity in Earth Science community on impact analysis terms, concepts, and methods.

ROSES Selection:
Multi-disciplinary Consortium led by Resources for the Future



ROSES-2016 A50

Support for GEO Work
Programme 2017-2019

Nine specific elements
(ones that Applied Sciences
personnel are leading or
significantly involved in);
consider SDGs as
appropriate

NOIs: Jan 13.

Full proposals: ~~Feb. 28~~
extended to March 10

Received ~105 NOIs

ROSES-2016 A51

Food Security and
Agriculture

Advance uses of Earth obs
to benefit food security and
agricultural practices.
Consortium to manage a
program of activities.
Scope includes apps.
development, user
characterization and
engagement, innovative
communications work, and
impact assessments.

NOIs: Feb 17.

Full proposals: April 7.

ROSES-2017

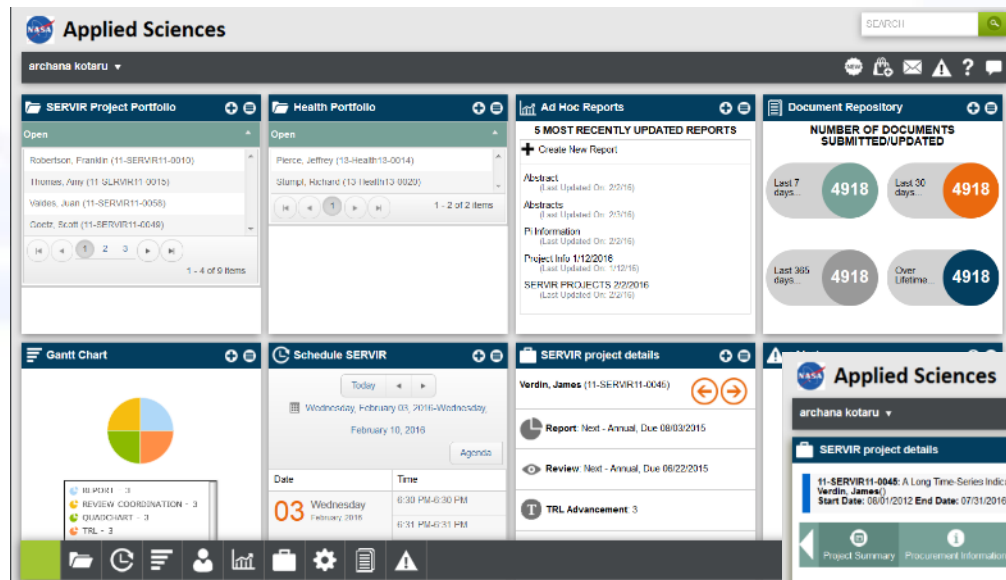
Anticipated solicitations in:

- » Health & Air Quality
- » Disasters

ROSES-17 released in
mid Feb.

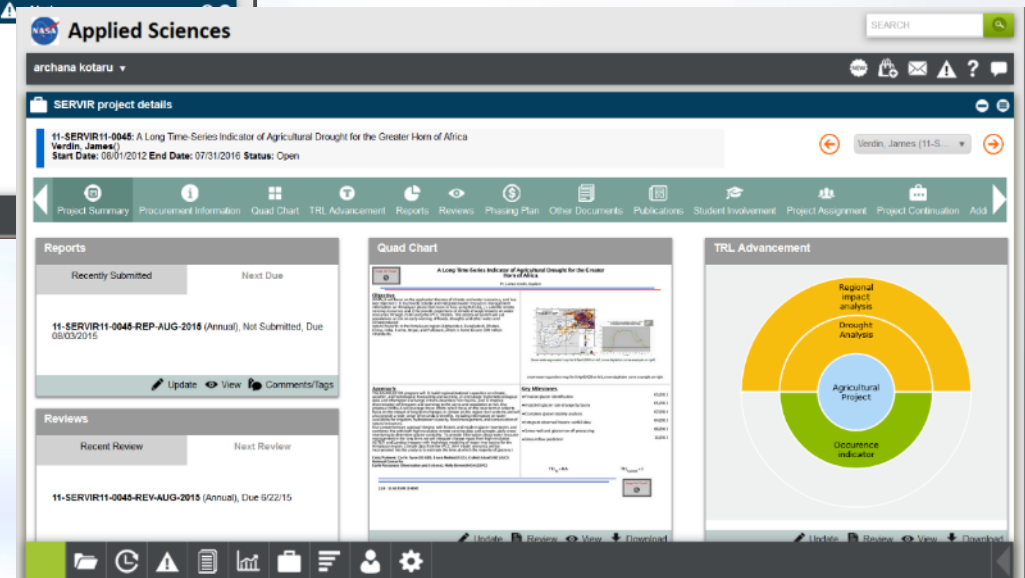


Migrated to new system to track projects and analyze project portfolios.
Streamlines functions and new capabilities for PI/project teams



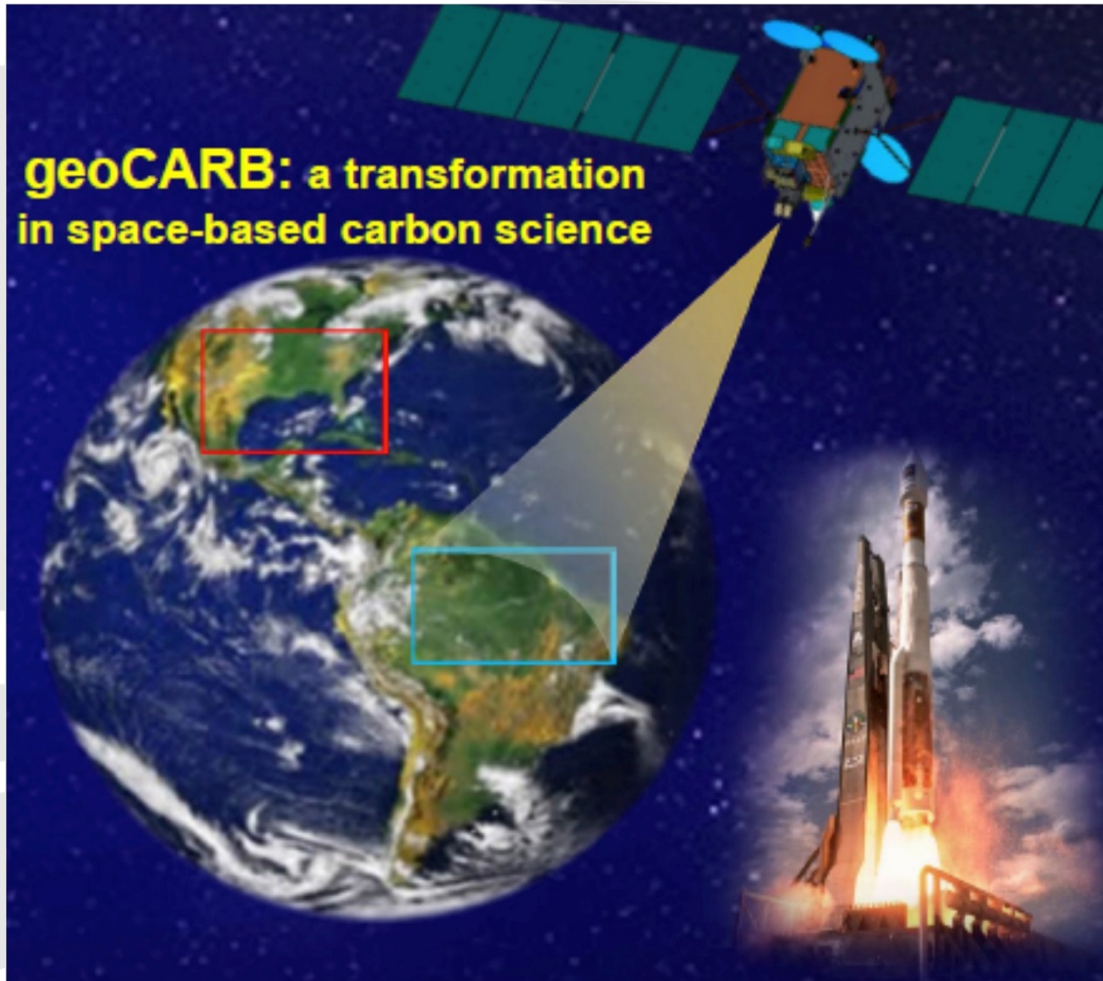
« Dashboard

Project Details »





geoCARB Selected for EVM-2



Berrien Moore, PI
University of Oklahoma

- First geostationary measurements of CO₂, CO, CH₄, and Solar Induced Fluorescence; 5-10 km resolution
- Hosted payload on an SES commercial communication satellite (PI-arranged hosting)
- Lockheed Martin Advanced Technology Center (Palo Alto); Colorado State University (Fort Collins); ARC; GSFC; JPL

NASA Earth Science



Small Satellite Constellation Initiative

Explore strategic approaches for the ***acquisition of measurements by small-satellite constellations***, and the potential of these products to advance NASA's Earth system science and applications development goals.

RFI in July 2016; 5 responses

Info on feasibility of ***purchasing from the private sector, and evaluating, small-satellite data products*** that might augment or even replace NASA-collected data. Favorable industry responses. Identified as acquisition targets:

- » GNSS Radio Occultation (GRO) and
- » Moderate resolution, multispectral, spatially and temporally extensive land imaging data

NASA will likely proceed with an RFP
Investing ~\$20M total in data purchases

SLI-T: Sustainable Land Imaging-Technology

Six new technology studies, are underway to enable and reduce costs for future land imaging measurements.

Selected through a competitive solicitation in 2016.

Managed by the NASA Earth
Science Technology Office



2017 Earth Science Senior Review – April/May 2017

Operating Mission List for Consideration in Senior Review

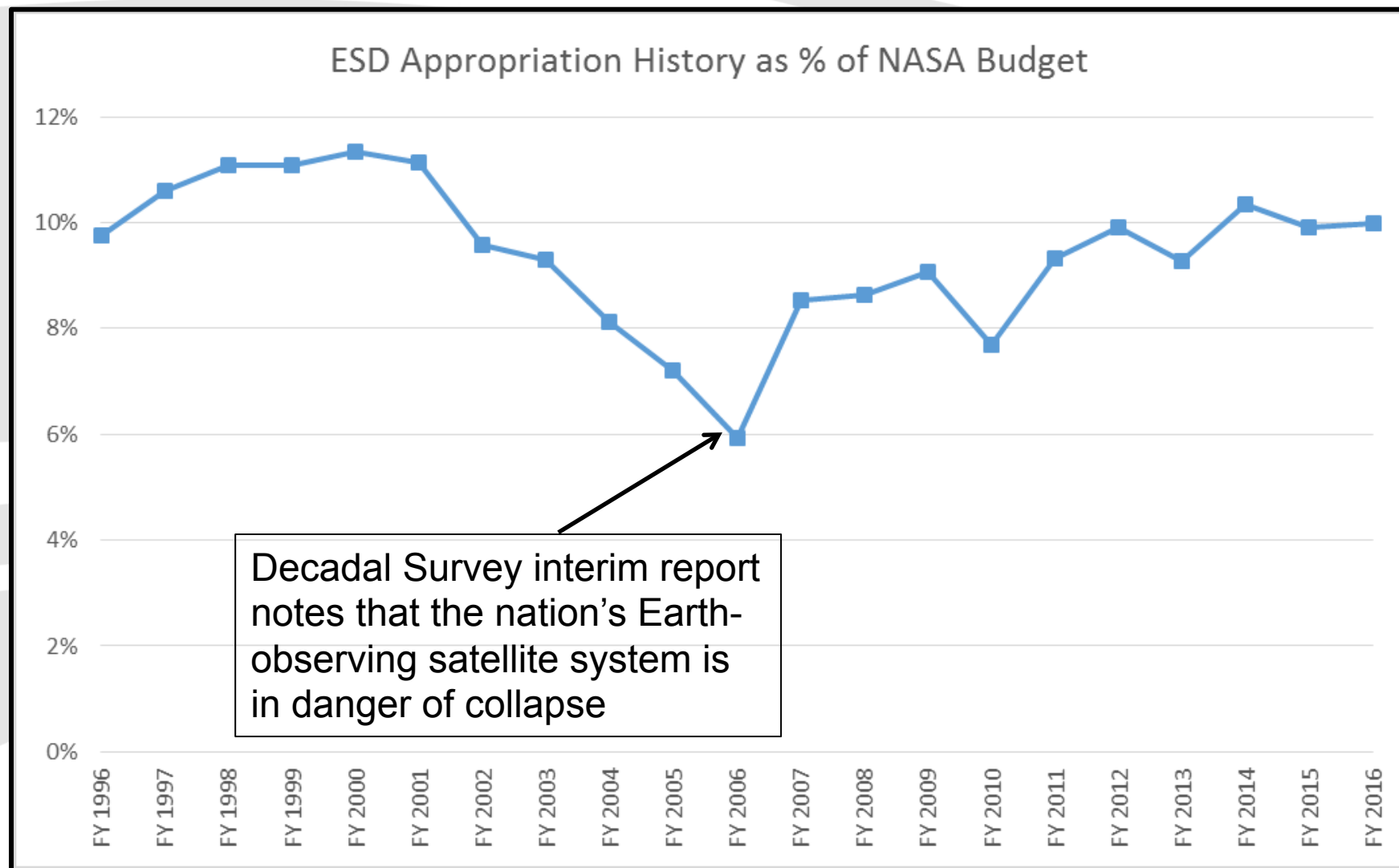
Missions Included:

- Thirteen missions are invited: Aqua, Aura, CALIPSO, [ISS-CATS](#), CloudSat, [DSCOVR Earth Science Instruments](#), [GPM](#), [OCO-2](#), QuikSCAT, [SMAP](#), [SORCE](#), [TCTE](#), and Terra. (Blue: New to the Senior Review)

Missions NOT included

- EO-1:** Termination is scheduled in February 2017, based on 2015 SR findings.
- GRACE:** GRACE is projected to re-enter due to orbital decay in approximately March 2018; this limits extension to less than a year into the Senior Review timeframe of 2018-2023. Preparing & reviewing a full proposal is a less-than-efficient use of time for both mission and Review Panel. The 2015 review panel's findings specifically supported extension until re-entry, with additional findings to address the situation should one of the twin satellites fail; ESD will use these findings to direct the limited GRACE extension.
- Suomi-NPP:** NOAA has stated that they will continue operating Suomi-NPP until JPSS-2 is on-orbit. No proposal for extension is required.
- OSTM:** Although OSTM has been extended through the Senior Review process in the past, it is also operated by NOAA for operational purposes, and NOAA has stated that they will continue operating OSTM until it fails (similar to the Suomi NPP commitment). Therefore, no proposal for OSTM extension is required in 2017.
- Landsat-7 and Landat-8:** operated by USGS, no NASA MO&DA funding
- CYGNSS, SAGE-III, ISS-LIS:** in prime mission

ESD Appropriation Time Series



You and YouTube

AGU 2016: Waleed Abdalati gave Tyndall Lecture
The Power of Perspective (Earth from Space)

<https://www.youtube.com/watch?v=vLg8ICaTpyo>



Video is about 50minutes.

Highly recommend the entire video.
Some special highlights on science and society are from 39:00 to the end

Communicating Controversial Topics

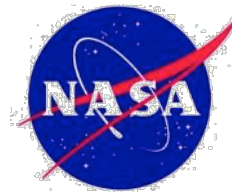
- Understand the context
 - Your adversaries are not as dumb as you want them to be
 - Understand what they believe and why
- Frame your view in ways that resonate
 - Don't be the condescending authority
- Don't tell people what they should think
 - Recognize that beliefs are rooted in values
 - Don't expect your values to change their beliefs
- Don't be outcome-centric

Know Your Audience



Two key points to remember:

- » Earth observations and Earth science data are objective, transparent, and policy-neutral.
- » NASA Earth Science doesn't develop or prescribe policy. Other agencies and organizations use the data and scientific results in their policy analysis and development.



Flight Projects: Proposed Directive on Applications

Directive/Guidelines to Satellite Mission Teams (aka, Flight Projects) to design and implement an “applications program”

Proposed approach is under review within NASA Earth Science

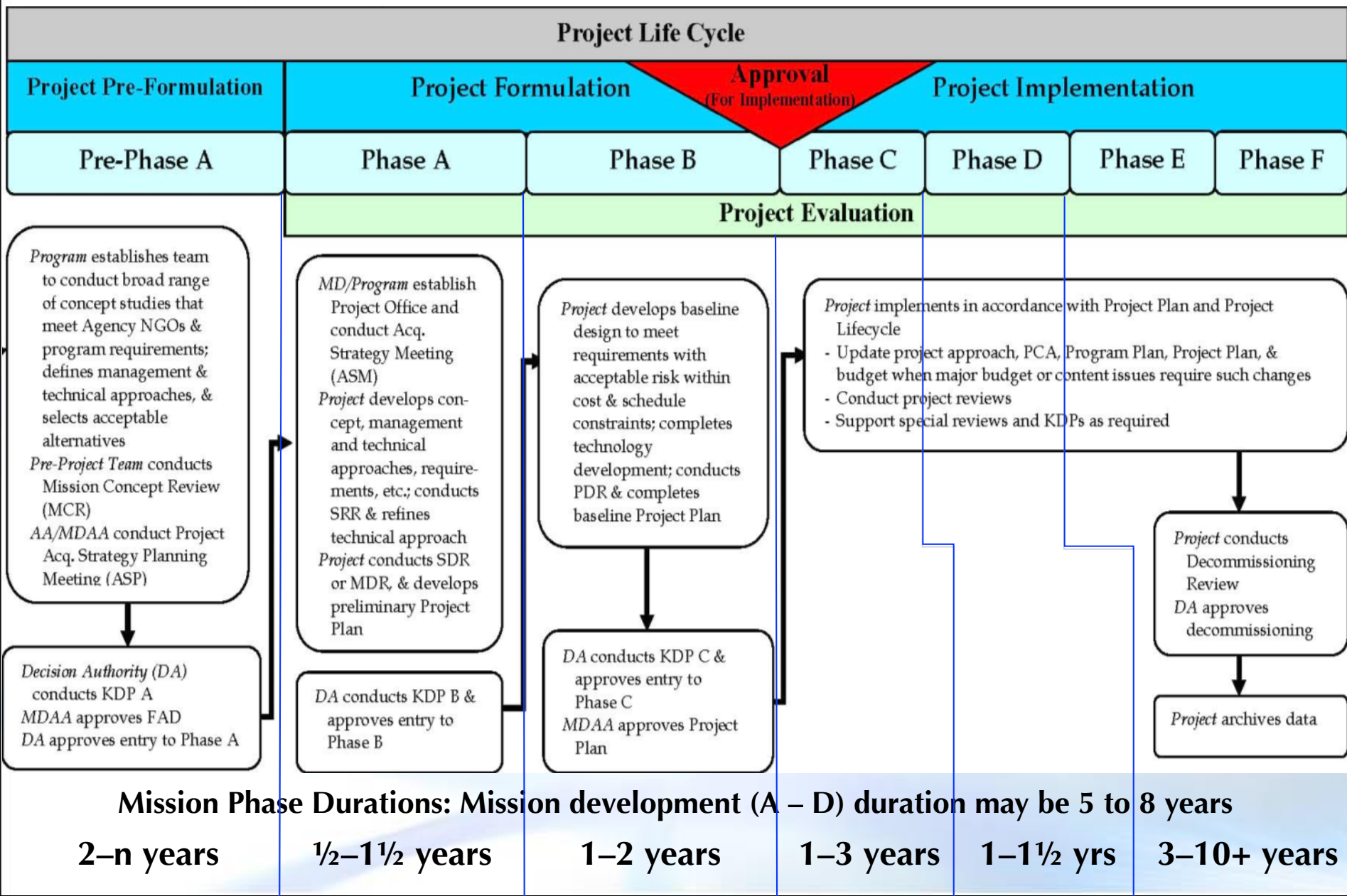
If approved, these would apply to NEW decadal survey missions.

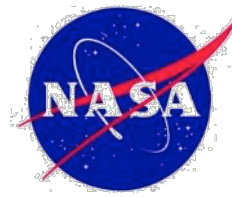
Flight projects could tailor guidelines to particulars of the mission.

Existing missions would be encouraged to follow (depending on the phase of the mission).

Series of workshops nationwide to roll-out the directive/guidelines

NASA Flight Project Life Cycle





Interagency & International Activities

USGEO: U.S. Group on Earth Observations

Satellite Needs Process

2nd National Civil Earth Observations Plan

Hosting GEO Plenary in Washington, DC, in Oct. 2017

GEO: Group on Earth Observations

New Work Programme 2017-2019

GWIS: Global Wildfire Information System. *Vince Ambrosia is the USGEO POC*

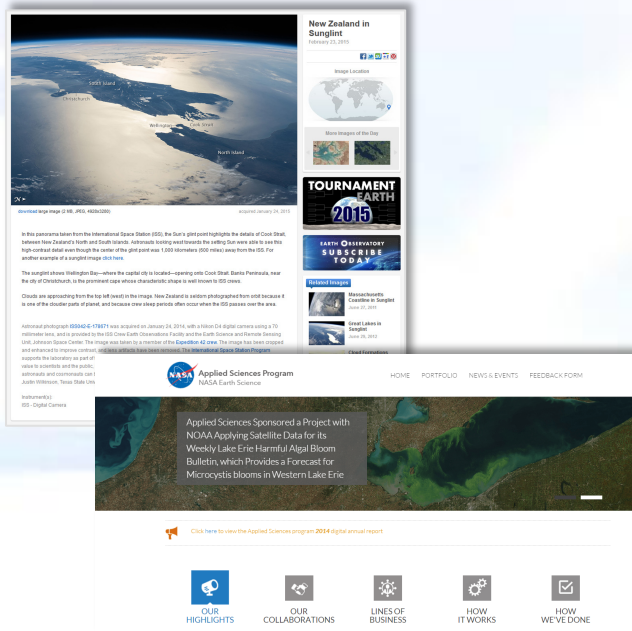
Sustainable Development Goals

Communications

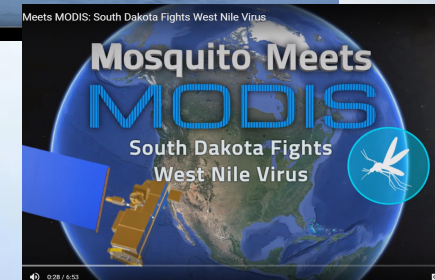
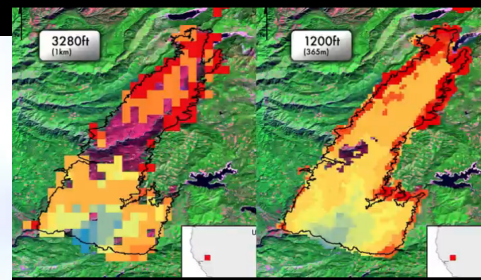


A significant emphasis on communications and outreach activities, especially to convey results to broad audiences.

Website, Earth Observatory



Videos



In Search Of ... Project Highlights



The NASA Science Mission Directorate (SMD) senior management conducts a *monthly* review of noteworthy advancements. Earth Science & Applied Sciences are always in need of project highlights for these SMD “monthly status reviews.”



Substance Suggestions:

- » Accomplishments and major milestones.
- » The “ists”: First, longest, etc.
- » Things that directly affect daily lives
- » Addresses “Why now?” Needs a reason to be shown *now*
- » How NASA data improved something

Freilich Factors: He studies up a lot (reads the papers, Notes, background info); approaches it for the “teaching moment”

Logistical Guidelines & Other:

- » One PPT slide
- » Arial font only, 14-pt or larger
- » Axes must have labels and units
- » Graphs, etc. must have a legend
- » Figures large enough to be legible
- » Put minimal text or bullets on a slide; increase size of images
- » Relegate most of text to “Notes”
- » A supplementary 1-page Word doc to explain issue & images is liked

In Search Of ... Project Highlights

Your
Logo
Here

The NASA Science Mission Directorate (SMD) senior management conducts a *monthly* review of noteworthy advancements. Earth Science & Applied Sciences are always in need of project highlights for these SMD “monthly status reviews.”



Nots:

- » Project description or summary by itself (without accomplishment)
- » Progress reports
- » Held a meeting or workshop (without impacts, significant findings, insights, importance)
- » Publications in journals known only to that field
- » No apparent application or management decision
- » Future activities (unless paired with actual accomplishment or major milestone)

Can each project
“take a month” for
the rest of 2017?

Project Portfolio: 9 Phase II Projects



NASA ESD Applied Sciences: Wildland Fire Phase II (ROSES-11 A.35)

PI	PI Org	Title	Associate PM
Weber	Idaho State University	RECOVER: Rehabilitation Capability Convergence for Ecosystem Recovery	Ambrosia
Schroeder	University of Maryland	Development and Application of Spatially Refined Remote Sensing Active Fire Data Sets in Support of Fire Monitoring, Management and Planning	Soja
Howard <i>Joshua Picotte</i>	SAIC (USGS-EROS)	Utilization of Multi-Sensor Active Fire Detections to Map Fires in the U.S.: The Future of Monitoring Trends in Burn Severity (MTBS)	Soja
Peterson	USGS EROS	Enhanced Wildland Fire Management Decision Support Using LIDAR-Infused LANDFIRE Data	Ambrosia
Vogelman	USGS-EROS	Improving National Shrub and Grass Fuels Maps Using Remotely Sensed Data and Biogeochemical Modeling to Support Fire Risk Assessments	Ambrosia
Miller	MTRI	Linking Remote Sensing and process-Based hydrological Models to Increase Understanding of Wildfire Effects on Watersheds and Improve Post-Fire remediation Efforts	Ambrosia
Holden	USFS-RMRS	A Prototype System for Predicting Insect and Climate-Induced Impacts on Fire Hazard in Complex Terrain	Ambrosia
Tabor	Conservation International	An Integrated Forest and Fire Monitoring and Forecasting System for Improved Forest Management in the Tropics	Soja
Schranz	NOAA /ESRL	Wildland Fire Behavior and Risk Prediction	Ambrosia

Performance: ARL – 9 Phase II Projects

Project Portfolio

ARL 1-3: 0 projects
ARL 4-6: 5 projects
ARL 7-9: 4 projects

Mean: ARL 5.89
Median: ARL 6
Mode: ARL 7 (4 projects)

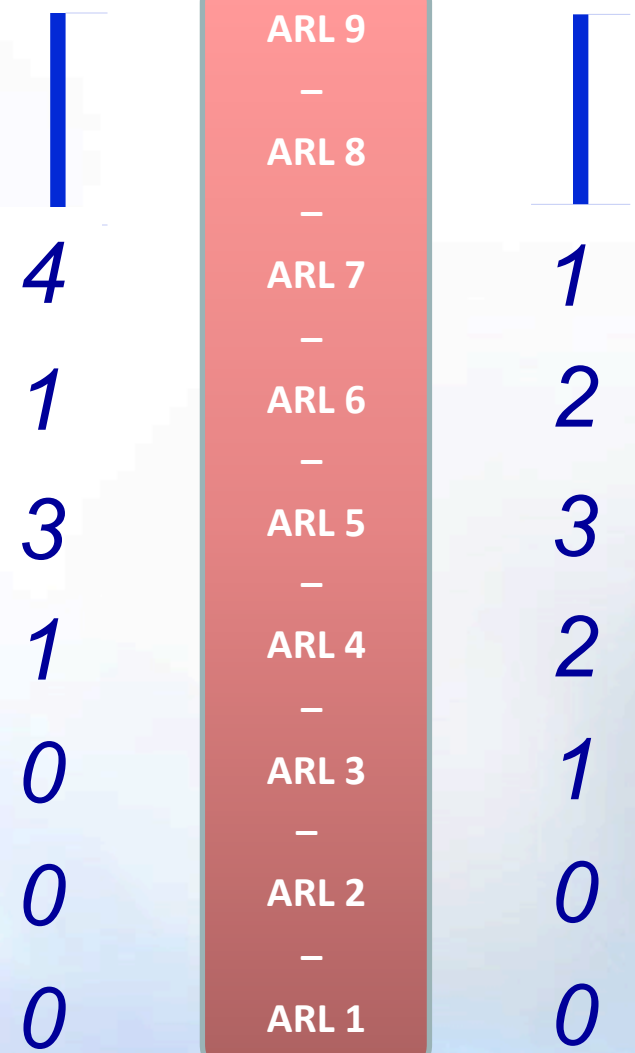
Performance of portfolio:

FY15: 6 advanced 1+ ARL

FY16: 7 have advanced since
September 2015

Jan 2017

Sept. 2015



Budget, Obligations and Cost Status

As of:
11 Jan 2017



Wildland Fires	Approved Budget	Committed	Uncommitted	Obligated	Unobligated	Costed	Uncosted	% Costed
PY17	628,531	547,607	80,924	541,200	87,331	29,231	599,300	5%
PY16	3,579,727	3,494,020	85,707	3,480,525	99,202	1,425,431	2,154,296	66.2%
PY15	1,247,438	1,245,260	2,178	1,245,260	2,178	1,189,175	58,263	95%
PY14	2,861,827	2,855,547	6,280	2,855,547	6,280	2,801,916	59,911	97.8%

Notable items

- Most of Year 3 fund were committed in Aug 2016 (FY16) and some in Oct/Nov. 2016 (FY17)
- PY 2015 funding went out late in PY2015 (2 PIs at ~72.5K uncosted, (Better than Nov '16: \$58.26K uncosted)
- PY 2014 uncosted is largely one PI (\$53,630) and ARC (\$6,185)

Wildland Fires

NASA
Earth Science



NASA Spinoff (December 2016)

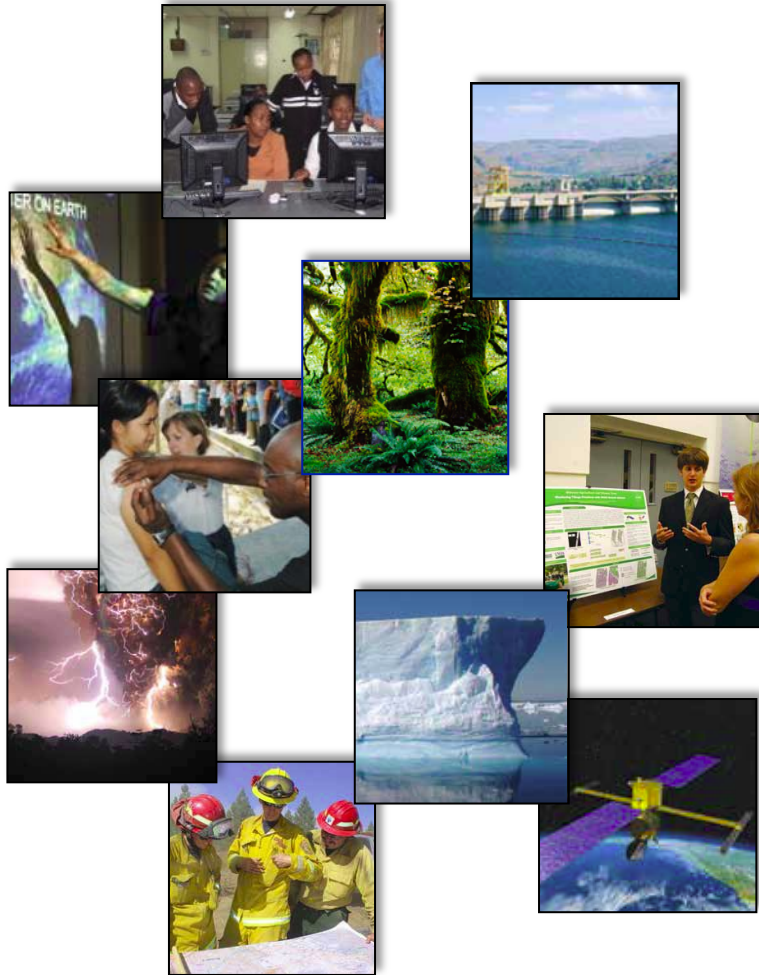
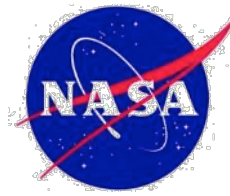
Karyn Tabor, Conservation Intl.
Eyes in the Sky Spot Flames on the Ground.

<https://spinoff.nasa.gov/Spinoff2017/>

2016 Wildland Fires Annual Summary



<http://AppliedSciences.NASA.gov>



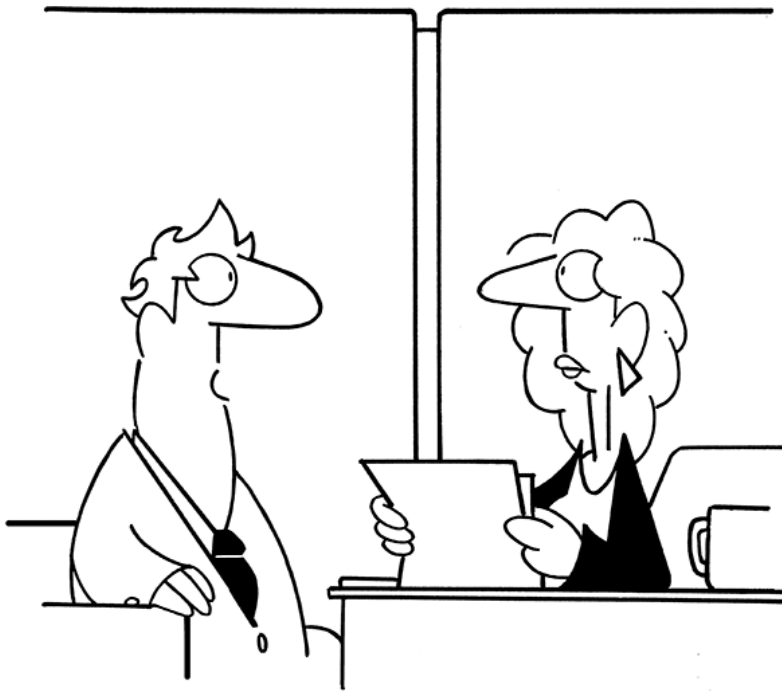
Wildland Fires Team Meeting

- » Agenda
- » Objectives
- » Lessons

Lessons Learned

Lessons Learned
recognise mistakes
observe what works
document them
share them

© Randy Glasbergen / glasbergen.com



**“Yes, I think I have good people skills.
What kind of idiot question is that?”**



If you're not learning from your mistakes, it is like playing battleship without the white pieces.





Questions & Discussion

Wildland Fires Team Meeting Feb. 28-March 2, 2017



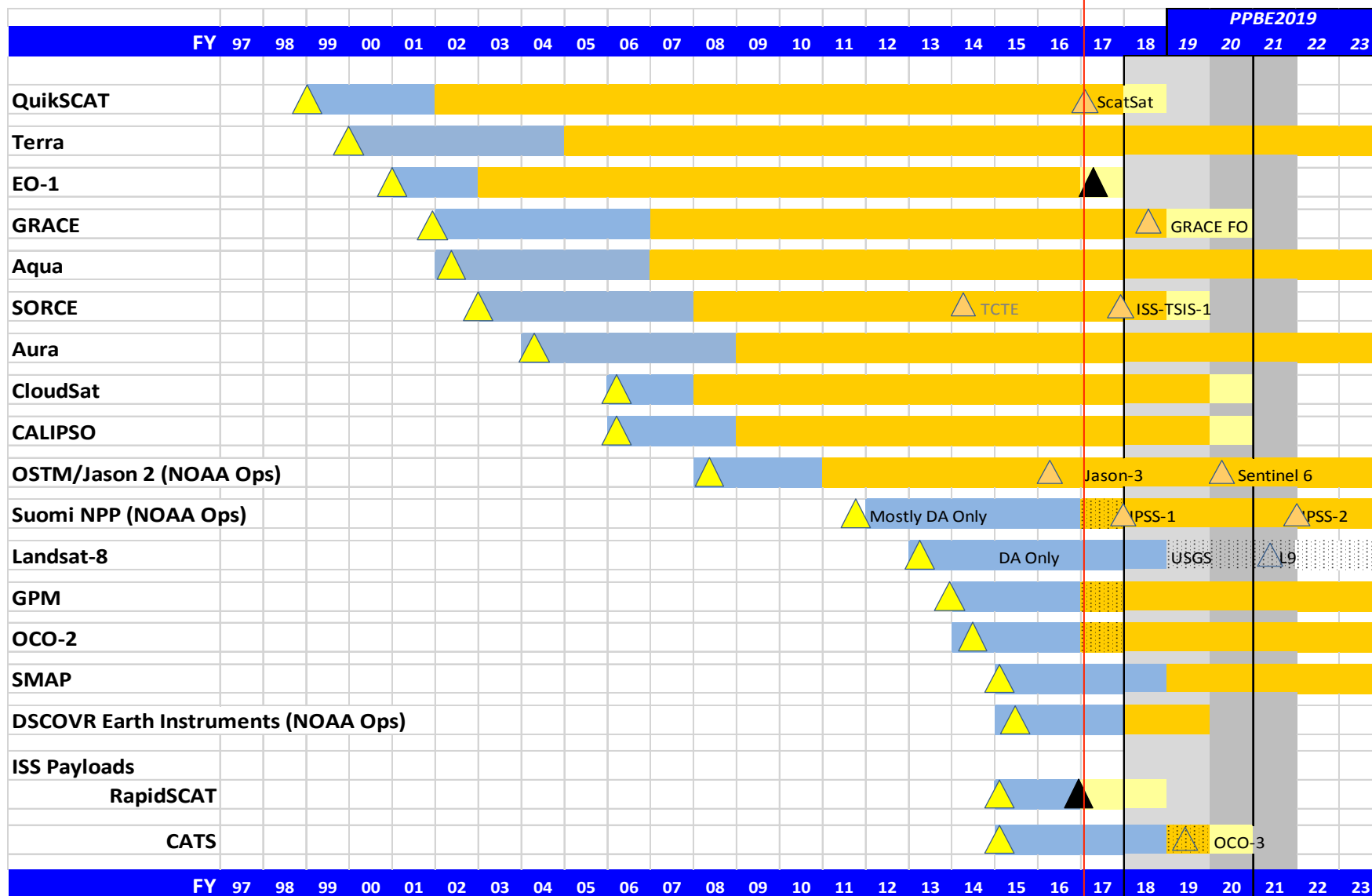
Back-up Materials

Wildland Fires Team Meeting March 1-3, 2016



ESD Operating Missions

Prime
Extension
Phase F



TODAY

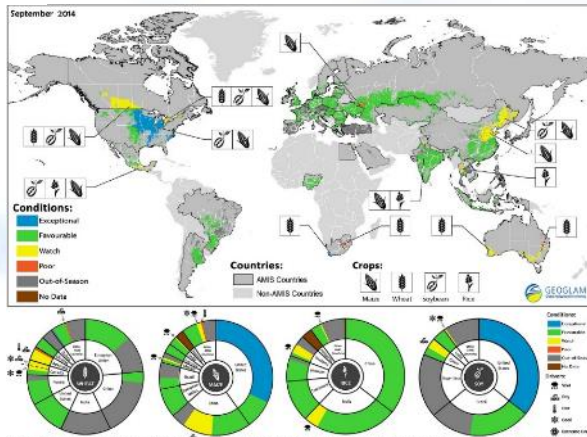
Policy-driven Activities



G20 Final Declaration

44. We commit to improve market information and transparency in order to make international markets for agricultural commodities more effective. To that end, we launched:
- The "Agricultural Market Information System" (AMIS) in Rome on September 15, 2011, to improve information on markets ...;
 - The "Global Agricultural Geo-monitoring Initiative" (GEO-GLAM) in Geneva on September 22-23, 2011. This initiative will coordinate satellite monitoring observation systems in different regions of the world in order to enhance crop production projections and weather forecasting data.

<http://www.amis-outlook.org/amis-monitoring>



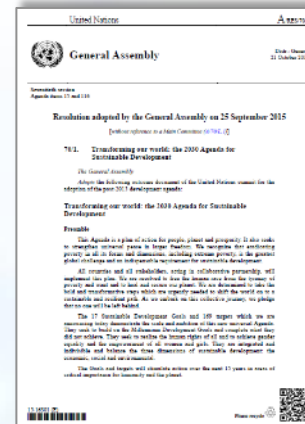
Crop production conditions for wheat, maize, rice and soybean are based on a combination of national and regional crop production data using both satellite and ground data. Conditions are based on information as of September 2015. Crop production conditions for wheat, maize, rice and soybean are displayed on the map with the following legend: Favorable, Watch, Poor, Out-of-Season, No Data.

THE GLOBAL GOALS For Sustainable Development



Article 76:

We will promote transparent and accountable scaling-up of appropriate public-private cooperation to exploit the contribution to be made by a wide range of data, including Earth observation and geo-spatial information, while ensuring national ownership in supporting and tracking progress.





ROSES-2016 A.50 Solicitation: GEO Work Programme

Request for proposals to support
nine specific elements within the
GEO Work Programme 2017-2019

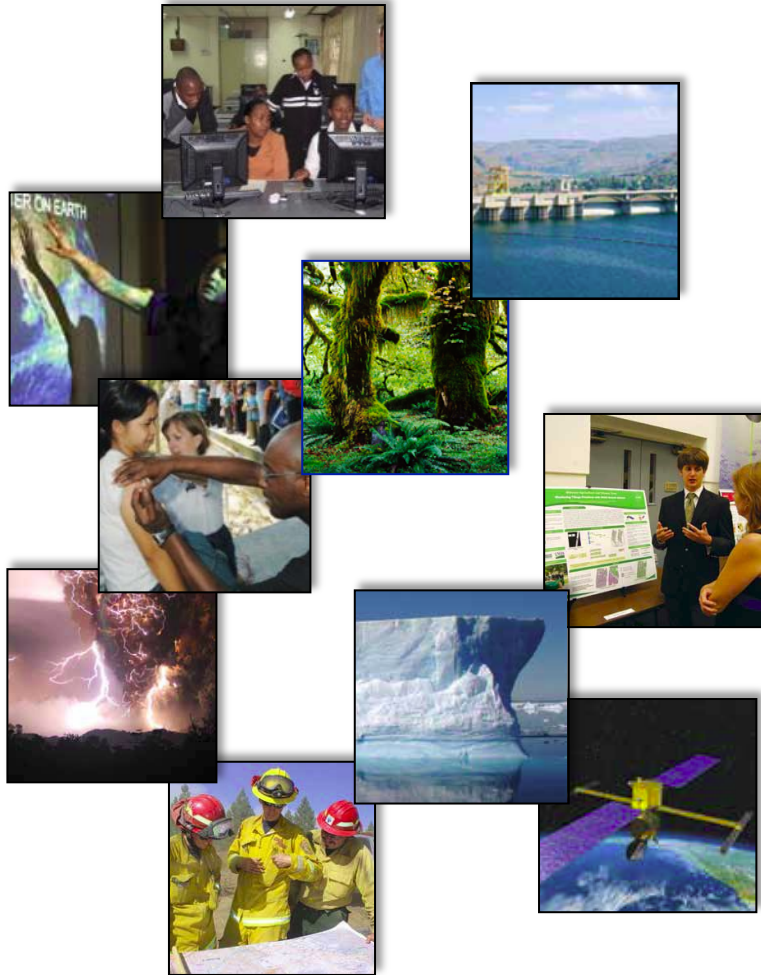
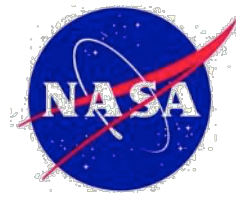
Elements align with ones that
Applied Sciences personnel are
leading or significantly involved in

Consider SDGs as appropriate

Notices of Intent are due Jan 13

Full proposals are due Feb. 28

- » AmeriGEOSS
- » EO4EA
- » GEOGLOWS
- » GEO BON
- » GEOVENER
- » Global Flood Risk Modeling
- » GWIS
- » Health
- » Human Planet



Communications

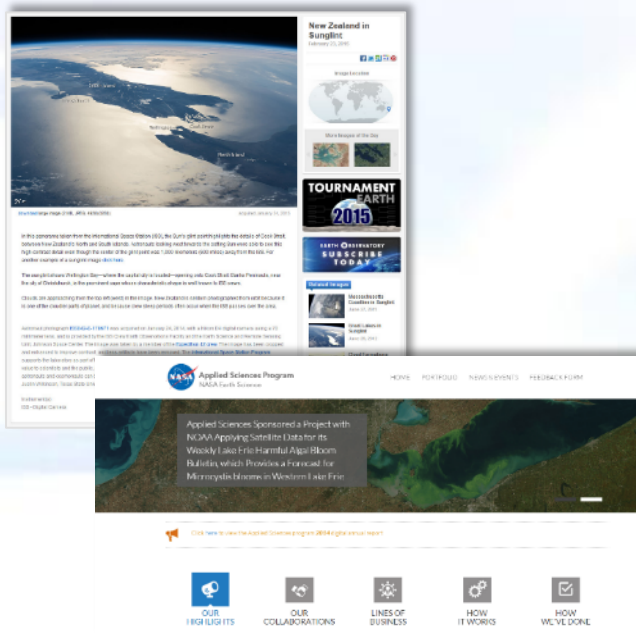
Communications



A significant emphasis on communications and outreach activities, especially to convey results to broad audiences.



Website, Earth Observatory



Videos



Results

Factors to consider in articulation and communication of results, as offered by ESD Director.

Earth Science Overall:

- » What was the problem?
- » What did we do?
- » What did we learn? What came from our action?
- » What was the result?
- » What is the benefit and significance?

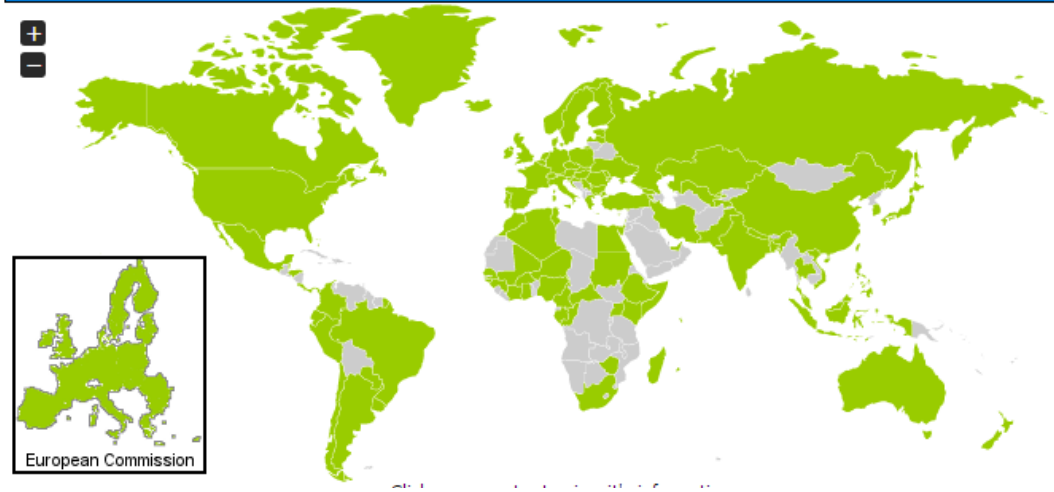
Applications:

- » User group that clearly benefits and that clearly state its benefits (and use of Earth observations)
- » Clear connection to NASA Earth science
- » Context & anecdote that is clear

GEO is an intergovernmental organization working to improve the availability, access, and use of Earth observations to benefit society.

GEO is organizing efforts to coordinate observations from thousands of ground, airborne, in situ, and space-based instruments.

GEO focuses on Earth obs. for eight societal benefit areas, such as water, health, disasters, and agriculture.

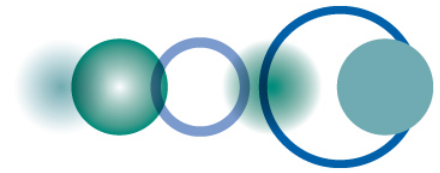


***Currently: 102 Members Countries and
92 Participating Organizations.***



Recent Activities:

- » Ministers approved a new strategic plan for 2016-2025
- » World Bank became a new Participating Organization
- » New Work Programme structure
- » AmeriGEOSS initiated



Societal Benefit Areas



Disaster Resilience



**Energy and
Mineral Resources
Management**



**Food Security and
Sustainable
Agriculture**



**Public Health
Surveillance**



**Water Resources
Management**



**Biodiversity and
Ecosystem
Sustainability**



**Sustainable Urban
Development**



**Infrastructure and
Transportation
Management**

Note: Climate and weather cut across all SBAs



News

- » Jason-3 launch: 18 January 2016
- » Sentinel 3A launch: 16 February 2016
- » ASTER: Free and open data beginning April 1
- » China informed NASA that its TanSat satellite will not join the A-Train constellation. China did express interest to enhance data exchange and scientific cooperation.

Also

June 6-10: MODIS VIIRS Science Team meeting

Satellite Needs Process



United States
Group on
Earth Observations

In FY16 budget, OMB assigned NASA the responsibility for all civilian Earth-observing satellites (sans NOAA for weather and space weather).

OMB guidelines allow on this responsibility allow agencies to provide inputs to NASA for consideration of their needs for sustained measurements.

USGEO developed a Satellite Needs Process, conducted annually:

1. User agencies identify their needs
2. USGEO Sat. Needs Working Group (SNWG) compiles inputs; USGEO provides inputs to NASA
3. NASA reviews inputs; interacts with agencies as needed; makes decisions

Output: NASA informs agencies of decisions; provides explanation to OMB/OSTP on how it addressed inputs

NASA Role/Responsibilities

The agencies' needs serve as inputs into NASA decisions on which satellite measurements to fund. NASA develops its own process to assess the input.

NASA engages user agencies in trade-offs of end-to-end costs, capabilities, and risks to see to what extent it can serve the need.

NASA provides to OMB and OSTP a supplement to its budget request that explains how it addressed user agency inputs.

NASA has stated to USGEO that we'll look at creative ways to support inputs; it may take some iterations, and it may take seeing if an achievable 80% solution is better than an unachievable 100% one.

Earth Observations Serving Sustainable Development



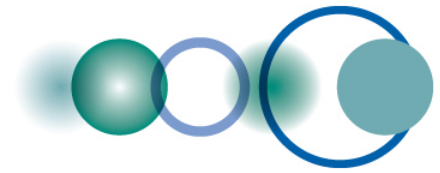
Sept. 2015: The UN General Assembly endorsed *The 2030 Agenda for Sustainable Development*, a global development agenda for all countries and stakeholders to use as a blueprint for progress on economic, social and environmental sustainability. 17 Goals and associated Targets and Indicators anchor the *Agenda*.

- » Opportunities in multiple SDGs to link Earth obs. and geospatial information to the indicators that will be used to assess the goals
- » Connections with statistics community on the Indicators
- » Development of methods for how Earth observations can contribute to the goals
- » Long-term capacity building to support countries and stakeholders use of Earth obs.



Opportunities for applications:

- Planning – Tracking
- Reporting – Evaluating



Global Wildfire Information System (GWIS)

Provide a platform for harmonized information and to enable the exchange and coordination of information among major national and regional fire information providers (e.g., existing systems in U.S., Canada, South Africa, Russia, Australia, and China).

GWIS seeks to link various national, global, and regional systems to make complementary Earth obs data on wildfires more readily available.

U.S. POC: Vince Ambrosia



In Search Of ... Project Highlights



Monthly, NASA Science Mission Directorate (SMD) senior management conducts a review of noteworthy advancements. Earth Science & Applied Sciences are always in need of project highlights for these SMD “monthly status reviews.”



Substance Suggestions:

- » Accomplishments and major milestones.
- » The “ists”: First, longest, etc.
- » Things that directly affect daily lives
- » Addresses “Why now?” Needs a reason to be shown *now*
- » How NASA data improved something

Freilich Factors: He studies up a lot (reads the papers, Notes, background info); approaches it for the “teaching moment”

Logistical Guidelines & Other:

- » One PPT slide
- » Arial font only, 14-pt or larger
- » Axes must have labels and units
- » Graphs, etc. must have a legend
- » Figures large enough to be legible
- » Put minimal text or bullets on a slide; increase size of images
- » Relegate most of text to “Notes”
- » A supplementary 1-page Word doc to explain issue & images is liked

In Search Of ... Project Highlights



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Nots:

- » Project description or summary by itself (without accomplishment)
- » Progress reports
- » Held a meeting or workshop (without impacts, significant findings, insights, importance)
- » Publications in journals known only to that field
- » No apparent application or management decision
- » Future activities (unless paired with actual accomplishment or major milestone)

Does each project want to “take a month” for the rest of 2016?

Results

Factors to consider in articulation and communication of results

Earth Science Overall:

- » What was the problem?
- » What did we do?
- » What did we learn? What came from our action?
- » What was the result?
- » What is the benefit and significance?
- » What is the new question(s) based on what we learned?

Applications:

- » User group that clearly benefits and that can clearly state its benefits (and use of Earth observations)
- » Clear connection to NASA Earth science or Earth obs. of key partners
- » Context & anecdote that is clear
- » Substantive and specific testimonial (e.g., what decision was informed or changed; why is that significant)

And ... But ... Therefore

ABT: And-But-Therefore

- » A framework and science communication tool.
- » A simple one-sentence, fill-in-the-blanks template

To find out more:

Book: *Houston, We Have a Narrative*

Video: *From Aristotle to South Park*

<https://www.youtube.com/watch?v=BfnxfNJRk7g>



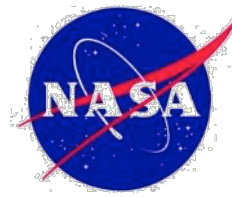
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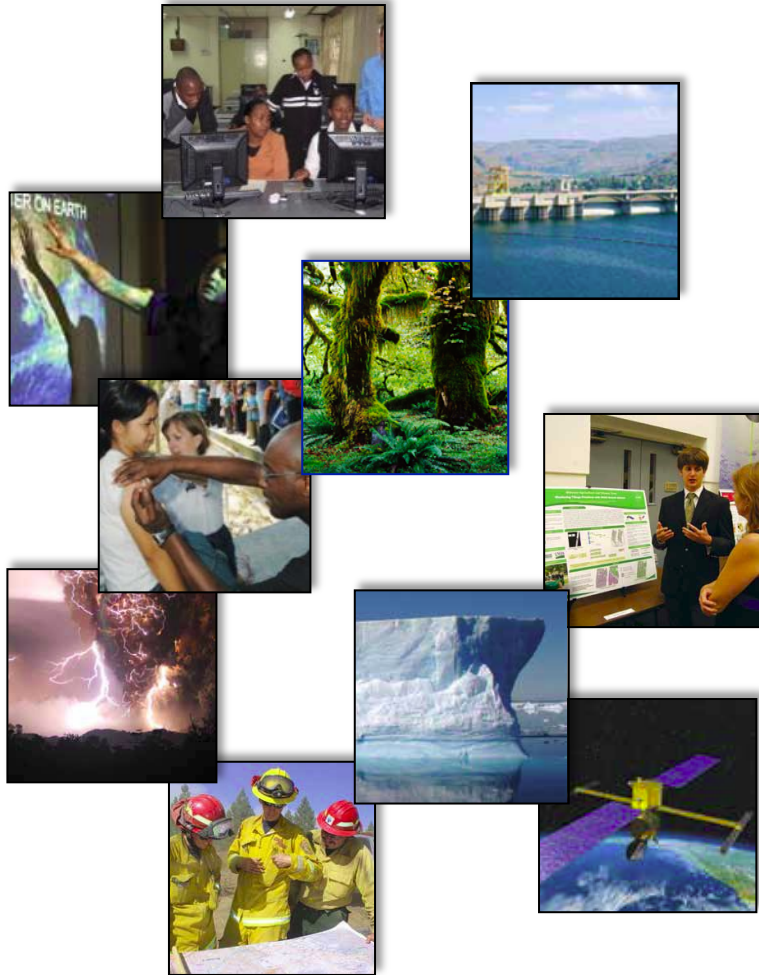
- » A framework and science communication tool



I can tell you the story of a little girl living on a farm in Kansas AND her life is boring, BUT one day a tornado sweeps her away to the land of Oz, THEREFORE she must undertake a journey to find her way home.



Socioeconomic Benefits and Impacts Assessments





The Program conducts impact analyses of selected projects to assess the value and benefits (in social and economic terms) from uses of Earth obs. to inform decisions and associated actions.

- » Strategically important for Earth science community to have skills & abilities (or know how to access them) to document impacts
- » Part of effort is bridging the social sciences & economic fields with the Earth science and physical science fields.

Primer's Purpose:

Inform the Earth science community and project teams about the language, key principles, techniques, and applications of socioeconomic impact analyses.





Terminology Transfer in Interdisciplinary Work

Economics & Policy Analysis

- » Marginal Cost
- » Shadow Price
- » Discount Rate
- » Contingent Valuation
- » Cobb Douglas Function
- » Revealed Preference
- » Marginal Utility
- » Price Elasticity
- » Net Present Value

Earth Science, Remote Sensing, GIS

- » Spectroradiometer
- » Synthetic Aperture Radar
- » Normalized Difference Vegetation Index
- » Nearest Neighbor
- » Supervised Classification
- » Passive Microwave
- » Backscatter
- » Orthorectification
- » Data Assimilation

Terms shared by both (though meanings may differ)

- » Productivity
- » Kriging



Impact Assessments on Applications Projects

Conducted ~10 impact assessments

Support Bruce Wielicki's work with Roger Cooke/RFF on value of a climate observing system

As augmentations to existing grants, the Program sponsored impact analyses to assess the value and benefits (in social and economic terms) from uses of Earth observations:

- » 3 Water Resources Projects
- » 2 Health & AQ Projects
- » 4 Wildfires Projects

ROSES-15 A.45: Socioeconomic Benefits

Proposals to develop, implement, and manage a program of activities for the articulation of socioeconomic benefits of Earth science applications. Award is for a consortium of organizations. Two parts:

- » Impact Assessments: Methods & Examples
- » Capacity Building: Familiarity in Earth Science community on terms & concepts

Selection:

Valuation of Applications Benefits Linked with Earth Science Consortium (VALUABLES)

PI Organization: Resources for the Future

PI: Yusuke Kuwayama
(Replacement for Molly Macauley)



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